

BENEFIT-COST ANALYSIS NARRATIVE

The Benefit-Cost Analysis estimates that there will be more than \$119 million in total benefits over the 20-year analysis period (undiscounted), resulting from the \$30,991,000 investment. When evaluated on a discounted NPV basis (7.0 percent for all costs and benefits), the Project yields a benefit-cost ratio of 2.42 and a net present value of \$21,212,941. Benefits arise from various sources, including safety, ongoing maintenance cost savings, travel time savings, residual value and the value associated with health and amenity improvements. The proposed improvements will enhance safety for users of all transportation modes through Wells, promote the use of non-vehicular travel, reduce road maintenance costs, and significantly improve the aesthetics and quality of life for both regional residents and visitors relying on the commercial district, including tourists.

All savings are presented in 2024 dollars, and the Project is expected to start accruing full benefits in 2032, with the end of the 20-year analysis period set for 2051.

7.0% NPV Summary			
	Costs	Benefits	Discounted
Capital Cost	(\$22,208,755)		(\$14,938,515)
Operations and Maintenance		\$5,500,000	\$1,078,286
Safety		\$9,130,834	\$3,011,997
Travel Time Savings		\$71,045,758	\$23,181,290
Vehicle Operating Cost Savings		\$0	\$0
Emission Reductions		\$0	\$0
Amenity Benefits		\$19,483,967	\$6,267,660
Health Benefits		\$1,947,980	\$626,632
Residual Value		\$12,338,197	\$1,985,591
Total	(\$22,208,755)	\$119,446,736	\$21,212,941

Net Present Value	\$21,212,941
Benefit-Cost Ratio	2.42

User Volumes

Vehicle.Volumes.

The average of Annual Average Daily Trips along this 5.6-mile segment of Route 1 in Wells is estimated to be 14,000 AADT. This is based on historical traffic counts, as well as Streetlight Insight vehicle volume metrics for 2024. Maine's Statewide Travel Demand Model Forecast for this corridor assumes an annual 0.5 percent growth rate in vehicle trips.

The BUILD scenario includes traffic signal control upgrades, and it is assumed that these will not have an impact on the number of daily or seasonal vehicular trips compared to the No Build scenario. This is because it is assumed that most traffic along this corridor is inelastic due to parallel, high-capacity facility I-95. The annual average daily vehicle trips for the Build and No Build Scenarios are thus assumed to remain the same.

Pedestrian.and.Cyclist.Volumes.

Streetlight Insight's 2021 Annual Average Daily Volume metric for Route 1 in Wells shows a range of pedestrian volumes, with the downtown averaging 440 pedestrians a day, and a daily average of 40 bikes per day. Short term traffic counts taken in August show approximately 100 bicycles a day. Combining these data sources of short-term counts and big data, the No Build daily pedestrian volume is estimated as 440, and the daily cyclist volume is 50. While Streetlight provide annual averages metrics, we have used an annualization factor of 0.5 for both pedestrians and cyclist to calculate annual total trips. The No Build scenario counts 79,200 total pedestrian trips per year with an additional 15,800 induced trips in the Build scenario.

The annual rate of growth of pedestrian and cycling trips is assumed to follow the overall population growth rate of 23 percent over 20 years. The Maine State Economist office estimates that the Wells population will grow by 23 percent over 20 years, from 11,733 people in 2022 to 14,488 people in 2042¹. This rate of growth is extrapolated to the BCA's 20-year period of 2032 - 2051, which is reasonable considering the town of Wells is in a fast-growing region of Maine, with proximity to the Greater Portland Area, as well as Portsmouth, NH and the Boston Metro Area.

BENEFITS

Net Operations and Maintenance Costs

A modest overall benefit to the Project is the reduction in maintenance required post-construction, resurfacing roadways and repairing sidewalks to address deficiencies. Cyclical paving treatments are assumed to occur for both the Build and No Build scenario every 12 years. The NPV of the net savings in the build vs. no-build scenario amounts to \$1,078,286.

Safety

This BCA quantifies two significant safety benefits of the Project, which are the addition of a signalized intersection at a high crash location as well as the addition of 8.2 miles of new sidewalks. The project also includes 10 new crosswalks and 2 new signalized intersections, but the safety benefits from these improvements (NPV \$1,092,532) are excluded from the BCA to avoid double counting with the pedestrian amenity benefits.

The new signalized intersection at Chapel Rd experienced 10 B & C level injuries as well as 70 PDO crashes from 2021-2025. The safety benefits were calculated using a Crash Modification Factor of 0.56 for the installation of a traffic light (#325), the annualized crash occurrences at the intersection based on the past 5 years², as well as the BCA guidance's recommended monetized value of reduced fatalities and injuries by KABCO Levels.

Sidewalk safety benefits are calculated using a Crash Modification Factor of 0.598 for the separation between vehicles and pedestrians (#11246), the BCA guidance's recommended monetized value of reduced fatalities and injuries by KABCO Level, as well as annualized crash rates based on the most recent 5-year pedestrian crash data. There were 6 total pedestrian injuries (2As, 2 Bs, 2Cs) along the 5.6-mile section of Route 1 from 2021-2025, with 5 occurring on straight road segments and one at a driveway. The project's new sidewalks are assumed to address only the pedestrian crashes on the straight road segment and not at driveways or intersections, so only the driveway crash is not counted.

The calculated nominal annualized safety benefits are over \$456,000 per year, resulting in an overall NPV of \$3,011,997.

Travel Time Savings

The conversion of all traffic signals along the corridor to an adaptive signal control system is estimated to reduce travel time along the corridor between 10 to 50 percent³. The average driving time for the 5.6-mile corridor in either the north or south direction ranges from 9 minutes under free flow conditions to 16 minutes during the afternoon peak hour. For this BCA, the travel time savings are calculated assuming 12 minutes baseline drive

² Crash data is available on MaineDOT's public mapviewer (mdotinetapps.state.me.us/map/). The 10-year crash layer can be filtered by crash type, location and year.

³ FHWA. EDC-1: Adaptive Signal Control Technology www.fhwa.dot.gov/innovation/everydaycounts/edc-1/asct.cfm

time, a 10 percent travel time reduction and BCA guidance's parameter value for the hourly value of a vehicle trip of \$21.80 per hour (all-purpose category) and a standard vehicle occupancy of 1.52 persons per vehicle. The travel time savings of 1.2 minutes per trip equate to a \$0.66 benefit per trip. The corridor's Annual Average Daily Traffic volume is 14,000 results in over 5.1 million annual vehicle trips. The overall NPV of these travel time savings is \$23,181,290.

Amenity Benefits

The new sidewalks, traffic signals and enhanced crosswalks with RRFBs will provide continuous and safe pedestrian infrastructure that will significantly enhance the connectivity and quality of walking amenities along the central arterial road of Wells. The project will also ensure that the inconsistent lane striping will be corrected with 11 ft travel lanes and 5 ft shoulders through the length of the corridor. This will remedy the inadequate width of the existing bike lane from 2-4 ft up to the minimum standard of 5 ft. Amenity benefits were calculated for both existing and new users, with benefits for induced trips reduced by half. The NPV of these amenity benefits for pedestrians and cyclists is \$6,267,660.

Health Benefits

The addition of 8.2 miles of new sidewalks and 5.6 miles of improved bike lanes, as well as 10 new RRFBs at crosswalks, is expected to increase pedestrian and cyclist activity throughout the project area by 20 percent. The BCA calculations use the assumption of the national average of 68 percent and 59 percent of overall induced trips for walking and cycling respectively falling in the 20-74 age range, as well as the proportion of induced trips coming from non-active transportation modes is assumed to be 89 percent. The NPV of the health benefits for induced pedestrian and bicyclist trips is \$626,632.

Residual Value

Most project components are estimated to have a useful life of 45 years and the operational life for the BCA is assumed at 20 years. The residual value is calculated by linearly depreciating the total project cost (in constant 2024 dollars) by 45 percent (20 out of 45 years), with 55 percent of the value remaining. The NPV of the residual value is \$1,985,591.

COSTS

Construction Costs

The capital costs of the Project are broken out by preliminary & final design, construction engineering, and construction costs over a period of 6 years (2026-2031). The analysis assumes an annual inflation rate of 7 percent per year to convert between year of expenditure dollars and constant dollars (2024 \$). The total capital cost of the project in constant dollars (2024 \$) is \$22,208,755. The NPV of the overall project cost is \$14,938,515.

SUMMARY

The improvements to the Route 1 corridor in Wells, Maine is expected to have substantial benefits. The benefits and costs of these improvements were calculated using the BCA guidelines published in the December 2025 Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Benefits to the corridor include safety improvements, travel time savings, reduced operation and maintenance costs, improved pedestrian and cyclist amenity quality, health benefits and residual value of infrastructure. The Project would produce a benefit cost ratio of 2.42 and a net present value of \$21,212,941.